, INC.

MICROWAVE EQUIPMEMT

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Telephone
Matawan 1-2600

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Matawan-Freehold Road
Morganville, New Jersey

7 July 1955

file: Burial Packg.
1955

Central Intelligence Agency
Washington 25, D. C.

Attention: [redacted] 25X1

Gentlemen:

Thank you for your inquiry on the HUMID-TROL packagi[illegible] system which is now being marketed by these Laboratories. The HUMID-TROL is more than a moisture barrier........it is a m[illegible] or means of packaging any item of almost any size and contr[illegible] the relative humidity of an item over long periods of time. [illegible] unit itself is relatively expensive in first cost, when compared with some methods now used. But the results obtainable are unique and the life of the package and the number of times it may be reused without further expense are almost unlimited. We visualize no conditions, temperature or otherwise, in which it is not a practical method of preserving material against the ravages of moisture penetration and deterioration.

The container, up to this point, has been made out of stainless steel or aluminum, although further developments may indicate other materials as our investigations progress. The sealing gasket is impervious to temperature, has no "memory" and has the peculiar properties of not passing moisture, vapor or any combination of pressures or temperatures in which we have worked, from 180°F to -75°.

The items are simply packed in the container in the usual manner, the lid clamped on and the moisture vapor flushed out of the chamber by argon gas to any desirable or percentage of relative humidity down to as low as 1%. The small orifice is sealed off and the package is then ready for indefinite storage or shipping. No desiccants are required. The packaging operation may be done by relatively low echelon personnel.

Where advisable, a sensing device is available for packing inside the container so that, at any time during the storage period, the package may be checked by a simple meter from the outside to show the relative humidity of the package. This meter correlates temperature and moisture and gives a direct reading. 235979

Pretty strong statements...

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Centr...

Our early experience indicates that this simple, reusable packaging calls for a radical change in our thinking on the methods and conditions under which relatively valuable equipment or items may be stored. We are finding that, in many cases, manufacturers have learned to live with 40% relative humidity and have not dared to consider the advantages to themselves of storage under ideal conditions called for by the components of the stored item. A number of interesting proposals, on which we are working at this early date, indicate a varied and surprising number of unique applications for this system of vapor protection.

We thank you for your inquiry and will appreciate any further questions you have to ask or consideration you may wish to give HUMID-TROL as a possible solution to your storage problem.

Very truly yours,

LAVOIE LABORATORIES, INC.

James H. Smiley

James H. Smiley
Vice President Chg. of Sales

JHS:js
Encl.

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Long-Term Storage Container Is Developed by Lavoie Labs

Development of what is said to be the first "near perfect moisture barrier container, with complete scientific control of humidity," was announced yesterday by Stephen D. Lavoie, president of Lavoie Laboratories, Inc., Morganville, N. J.

The company specializes in design and manufacture of radar and electronic equipment and until recently has done almost all of its work for the U. S. Armed Services.

Lavoie stated that it was a search for better packaging of its own electronic devices that led it to develop a combination of material and design method that has resulted in a long-term storage container—the "Humid-Trol," which can maintain indefinitely a specified degree of relative humidity.

The company is offering Humid-Trol for protection against unstable humidity, dehydration, corrosion, fungi and other causes of deterioration. It has no size limitations and may be used to protect engines, missiles and even heavy tanks.

The Lavoie container is said to withstand submersion and altitudes up to 100,000 feet. It is resealable and reusable for storage at minus 80 degrees F. or plus 180 degrees F., and withstands thermal shock, the company claims.

The Humid-Trol is suggested for film, drawings, drugs, surgical instruments, tools, dies, electronic equipment, rifles and small arms, engines, missiles, navigation equipment and rescue equipment.

The principle of the Humid-Trol, according to company scientists, is a new type plastic fluorcarbon elastomer seal (gasket) which prevents water vapor from passing through.

PRESERVING CONTAINER

HUMID-TROL

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In the past as well as the present time, moisture has been a major problem in the storage and preservation of all types of equipment and materials.

Moisture has been a severe problem because of excessive corrosion to metallic parts, de-tuning of electronic circuits, as well as arc over, rotting and propagation of the various fungi, to mention only a few effects.

Equipment and materials may easily be kept dry during processing, but the period of time between manufacture and end use, changes of many characteristics prevent use of the item until complete overhaul and drying out is accomplished.

In the past few decades, man has tried his hand at preserving these items with coatings and in containers.

Coatings consist of Greases, Waxes, Plastics, etc. Most of these last only a short time. They must be removed and replaced at a minimum of twice a year (under ideal conditions) and as often as a dozen times (under some average conditions).

Containers, on the other hand, seem to be the more logical approach, but lack many necessary refinements. A small hole, crack, poorly made joint and inadequate gasket can cause

Lavoie Laboratories, Inc.
Matawan-Freehold Road
Morganville, New Jersey

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a vapor leak that would make the most expensive container useless.

Containers now in service will preserve equipment provided there is maintained a systematic inspection schedule to insure a Relative Humidity of less that 25%.

In the event the R.H. reaches a predetermined point, the container must be opened and dessicants reactivated or replaced. The item stored must be inspected and resealed.

So far all signs point to the need of a good moisture barrier container.

In order to appreciate the full values of a moisture-(water vapor) barrier, we must consider some of the physical properties of air and water vapor.

At ambient temperatures (65°) the vapor pressure of water at a R.H. of 95% is .62" mercury (.3 psig).

Now normally this low vapor pressure helps our preservation problem, but in the heat of summer with the container exposed to temperatures of 120°, as would be expected in the warm latitudes, and a R.H. of 95%, the vapor pressure rises to 3.44" mercury (1.7 psig).

This pressure forces the vapor into the container, thus raising the moisture content of the atmosphere inside.

Since a gas or water tight container should be enough to hold out water vapor, what factor allows the containers offered to pass vapor? The answer is that all materials are barriers, but not in the full sense of the word. Some materials, such as dry wood, will keep out vapor until the material is saturated to the point where it gives off vapor on the dry side, thus raising the R.H. Since wood saturates quickly, we can see that it is unsatisfactory. Now consider the Plastics and Resins. They are a much better barrier....but....they too become saturated with the same end result. Rubber?.....The same result. It takes longer to saturate various materials, but, they do become saturated. What about metal? Metals, too, pass vapor, but in extreme small quantities. This contributes to the large number of containers of metal used for storage of equipment such as jet engines, dies, electronic gear, etc. Then why the inspection and maintenance of these containers? To put it simply.....no satisfactory joint and gasket combination has been found that will keep out water vapors. That is, until now.....

After making numerous and extensive tests on all types of rubbers, plastics, etc., we have found an extremely good material for barrier use. With the design of a simple but effective joint and container, plus this material, we have at last found the near perfect moisture (water vapor) barrier container. We say "near perfect" for some day a better mater-

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ial will be discovered.....a better technique will be developed with a better container resulting.

CHARACTERISTICS

1. Fabrication Materials - Aluminum, steel, brass, copper, stainless steel.
2. Utility - Container may be opened and reclosed without losing moisture barrier properties of seal.
3. Temperature Range - 80°F to + 180°F. Container may be thermally shocked between these two extremes.
4. Preparation of Stored Material - Stored materials need not be greased, waxed or coated or otherwise prepared. They may be stored as is and always be ready for instant use.
5. Preparation of Container - In most requirements, no dessicants are needed to dehydrate the interior, although provision can be made when dryers are requested.
6. Sizes - There is very little limitation on size. Four foot diameters and twenty foot lengths are feasible.
7. Moisture Indicator - A built-in precision hygrometer is available when required.
8. Moisture Level - The R.H. can be held at 1% or at higher levels (when desired) indefinitely.

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9. Maintenance - No maintenance is necessary. The storage life of the container is a function of the life of the material used in its fabrication.

10. Costs - The cost of Humid-Trol containers is comparable to presently available rigid containers.

11. Fasteners - Various types of closings are available. These consist of latches or seal assemblies as required.

12. Configuration - At present all containers are cylindrical in shape, but rectangular types are under development.

ITEMS FOR STORAGE

Hermetically sealed equipment (normally discarded if needing adjustments) such as relays, stepping switch, gyros, etc.

Specialized electronics gear

Instruments of all types

Motor Generator sets

Tools and dies

Pumps and compressors

Guided missiles (standby - dry)

Engines, both jet and rocket

Medical supplies

Surgical kits (sterilized - instant use) CONFIDENTIAL

Rubberized goods (gas maske, rescue breathing apparatus)

Records and vital statistics

Standard and microfilms

Drawings

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